

Remarks

Claims 2-4, 6-7, 15, 16, and 20-24 are pending in the application. Claims 2-4, 6-7, 15, 16, and 20-24 were rejected.

The Examiner acknowledged that the Request for Continued Examination under 37 CFR 1.114 filed on November 23, 2010 has been entered; and that the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicants have amended claims 2, 7, 15, 20, 22, and 23 for clarification purposes. Support for these amendments can be found throughout the specification, for example, at page 4, lines 3-25, at page 5, lines 20-25, at page 6, lines 8-12, at page 7, lines 25-32 and at page 8, lines 3-6. No new matter has been added.

Attached in support of this response is the Declaration of Alessandro Carfagnini. Mr. Carfagnini is submitting this Declaration as one of skill in the art.

This Amendment, filed in reply to the Office Action dated February 15, 2011, is believed to be fully responsive to each point of objection and rejection raised therein.

Accordingly, favorable reconsideration on the merits is respectfully requested.

Response to Amendment

The Examiner acknowledged the amendment filed by Applicants on November 23, 2010, wherein new claims 20-24 had been added and claims 1, 5, 8-14, and 17-19 had been canceled. The Examiner indicated that, in light of the amendment, the previous rejections except those presented below were withdrawn.

Claim Rejections under 35 U.S.C. § 103

1. Danesi and Carfagnini

Claims 2-4, 6-7, and 15-16 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over US 4,477,631 ("Danesi") in view of EP 230,212 ("Carfagnini").

The Examiner contended that Danesi discloses a process for preparing a plasto-elastomeric composition having improved processability comprising dynamical vulcanization of a plastomeric olefinic polymer and EPDM (citing Abstract; col. 1, lines 66-68; and col. 2, lines 1-4), in the presence of halogen-donor free system consisting of phenolic non-halogenated resin and a metal compound selected from the group consisting of calcium carbonate (as to instant claims 7 and 15; citing Abstract and col. 3, lines 26-31), magnesium oxide, and alumina (citing col. 3, lines 26-31) to produce at least partially cross-linked elastomeric terpolymer (citing col. 3, lines 50-51), wherein the phenolic non-halogenated resin is having the following formula:



wherein X1 comprises $-\text{CH}_2-$; and

R is alkyl, aryl or alkenyl containing 4-16 carbon atoms (citing col. 1, lines 1-15).

The Examiner contended that phenolic resin is used in amount of 1-10 pbw and the ratio of the used calcium carbonate to phenolic resin is 0.5:1 to 5:1 (citing col. 3, lines 41-44). The Examiner reasoned that it would have been obvious to a one of ordinary skill in the art that calcium carbonate may be added during vulcanization in amount of up to 50 pbw. The Examiner further contended that the composition further comprises mineral fillers (citing col. 4, lines 7-12).

As for claim 2, the Examiner contended that the polyolefin comprises polypropylene (citing col. 4, line 38).

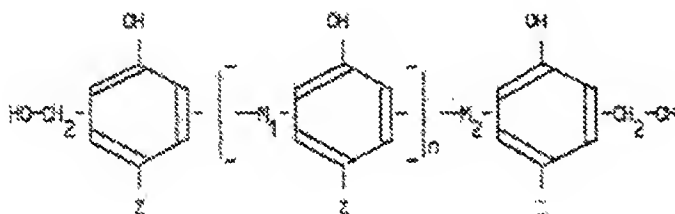
As for claim 3, the Examiner contended that the mixture comprises 20-60% of the olefinic polymer and 80-40% wt of elastomeric EPDM (citing col. 3, lines 32-37).

As for claim 4, the Examiner contended that the EPDM comprises two alpha-olefinic monomers and one dienic monomer (citing col. 2, lines 28-32).

As for claim 6, the Examiner contended that the dienic monomer comprises 1, 4-hexadiene, 2-methyl-1,4-pentadiene; 1, 4, 9-decatriene (citing col. 2, lines 33-38).

The Examiner conceded that Danesi does not explicitly disclose the non-halogenated phenolic resin curing system further comprising 0.1-8 pbw of salicylic acid; but contended that Carfagnini discloses a process for producing a plastomer-elastomer compositions from polyolefins and EPDM comprising: 1) masufication of the EPDM elastomer and fusion of the polyolefin plastomer; 2) thorough dispersion of the components; 3) cross-linking of the elastomeric component; and 4) even dispersion of any other additives (citing page 3, lines 54-58), wherein the elastomer is partially or fully cross-linked (citing Abstract), and the cross-linking agent consists of:

a) 0.5-15 pbw per 100 pbw of EPDM of non-halogenated phenolic resin having the following structure:



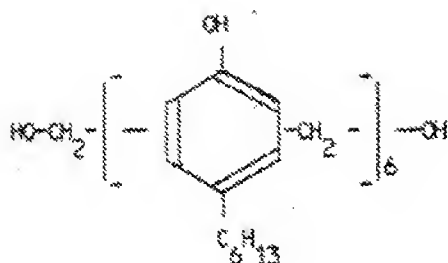
and M1 and M2 are radicals $-\text{CH}_2-$ or $-\text{CH}_2-\text{CO}-\text{CH}_2-$,

wherein Z is an alkylene, aryl or alkyl radical 4-16 carbon atoms; N is integer of 0-6 (citing page 3, lines 1-15); and

b) salicylic acid, admixed at a rate of 0.1-0.8 parts per 1 part of resin, by weight (citing page 3, lines 45-46).

The Examiner contended that the additives added in step 4) comprise carbonate and inorganic pigments (citing page 4, lines 18-25).

As for claim 16, the Examiner contended that the phenolic resin is a phenol-formaldehyde resol resin having the following formula:



The Examiner contended that Carfagnini teaches that the use of non-halogenated phenolic resin in conjunction with a salicylic acid will avoid environmental and personal risk stemming from the production of chlorine and will require considerably lower temperatures and less time for the implementation (citing page 2, lines 32-37).

The Examiner contended that since Carfagnini discloses the process for producing plasto-elastomeric composition similar to that of Danesi, and since the use of phenolic resin curing agent in combination with salicylic acid provides a process that will avoid environmental and personal risk stemming from the production of chlorine and that will require considerably lower temperatures and less time for the implementation (citing page 2, lines 32-37 of Carfagnini), it would have been obvious to one of ordinary skill in the art to combine the teachings of Carfagnini and Danesi and to use phenolic resin curing agent in combination with salicylic acid in the process of Danesi, as taught by Carfagnini, so as to ensure the process of Danesi will avoid environmental and personal risk stemming from the production of chlorine and will require considerably lower temperatures and less time for the implementation.

The Examiner further contended that though Danesi in view of Carfagnini do not explicitly recite the Shore hardness and specific gravity of the produced plasto-elastomeric composition, since the composition of Danesi in view of Carfagnini is produced by the process identical to that claimed in the instant invention with the use of the same curing system and metal compounds, such as calcium carbonate, in amount overlapping with that claimed in the instant invention, the properties of the plasto-elastomeric composition of Danesi in view of Carfagnini, including specific gravity and Shore hardness, will be intrinsically identical to those claimed in the instant invention. The Examiner contended that the composition of Danesi in view

of Carfagnini will intrinsically be recyclable and will not produce chlorine, dust, or will not contain heavy metals.

Applicants' Response

Applicants have amended claim 15 in order to clarify the claim language. As such, independent claim 15, as amended, recites that the crosslinking of EPDM terpolymer by a carboxylic acid catalyst and a nonhalogenated alkylphenol-formaldehyde phenolic resin and the filling with a basic inorganic filler are carried out in a single process.

The Obviousness Standard after KSR:

As reiterated by *KSR* and the 2010 *KSR* Guidelines Update, 75 FR 54643-60, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The factual inquiries enunciated by the Court are as follows: (1) the scope and content of the prior art, (2) the differences between the prior art and the claims at issue, and (3) the level of ordinary skill in the pertinent art. In addition, objective evidence relevant to the issue of obviousness, including commercial success, long felt but unsolved needs, failure of others, recognition of a problem, failed attempts to solve a problem, teaching away by those skilled in the art, and results unexpected to those skilled in the art, must be evaluated by Office personnel. See Guidelines.

KSR and the Guidelines set forth different rationales for an obviousness determination. These rationales, include:

- (A) Combining prior art elements according to known methods to yield **predictable results**;
- (B) Simple substitution of one known element for another to obtain **predictable results**;
- (C) Use of known technique to improve similar devices (methods, or products) in the same way;
- (D) Applying a known technique to a known device (method or product) ready for improvement to yield **predictable results**;

(E) "Obvious to try" - choosing from a finite number of identified, **predictable solutions**, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been **predictable** to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Attached in support of this response is the Declaration of Alessandro Carfagnini. Mr. Carfagnini is submitting this Declaration as one of skill in the art.

For the reasons set forth below, Applicant urges (1) that at the time the invention was made, the claimed invention as a whole would not have been obvious to a person of ordinary skill in the art over Danesi and Carfagnini; and (2) that there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements as suggested by the Examiner.

First, the cited references do not teach, disclose, or suggest every element of the claims as amended.

In this case, Danesi and Carfagnini, either alone or in combination, do not disclose, teach, or even suggest that a basic inorganic filler (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) can be added during crosslinking of a plasto-elastomeric mixture, which is catalyzed by an aromatic carboxylic acid, without affecting the catalytic activity of the carboxylic acid.

Danesi discloses a halogen-donor-free process for preparing plasto-elastomeric compositions, wherein a crosslinking step is carried out in the presence of (1) phenolic non-halogenated resin and (2) a metal compound (e.g., zinc oxide (ZnO), magnesium oxide (MgO), calcium oxide (CaO), iron oxide (FeO), titanium oxide (TiO), and silica (SiO_2)) in a ratio of 0.5:1 to 5:1. However, the metallic oxides disclosed in Danesi are distinguished materially from the basic (alkaline) inorganic fillers (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) utilized in the

claimed invention and also distinguished functionally from the claimed invention in that the metallic oxides are used as a co-catalyst rather than as a filling agent.

Carfagnini fails to remedy the deficiencies of Danesi.

Carfagnini discloses a process for preparing plastomer-elastomeric compounds wherein a cross-linking step is carried out in the presence of non-halogenated phenolic resin to which an aromatic carboxylic acid (e.g., salicylic acid) is admixed at a rate of between 0.1 and 0.8 parts per 1 part of resin. With respect to fillers, Carfagnini merely discloses that a thermodynamically cross-linked plastomer-elastomer mix may include additives, such as inorganic (e.g., silica and silicates) or organic (carbon black) strengtheners, plasticizers (e.g., mineral oils, wax, paraffin), fillers (carbonates, kaolin, talc, calcined clay, heavy spar, asbestos, and the like), antioxidants, ozone, ultra-violet inhibitors, peptizing agents, anticoagulants, organic and inorganic pigments, or vulcanizing agents. However, Carfagnini does not disclose, teach, or even suggest that a basic inorganic filler (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) can be added during crosslinking of a plasto-elastomeric mixture, which is catalyzed by aromatic carboxylic acid, without affecting the catalytic activity of the carboxylic acid.

Second, there is no teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art references or to combine prior art reference teachings to arrive at the claimed invention.

Applicants urge that a rationale offered to support a rejection under 35 U.S.C. 103 must rely on logic and sound scientific principle (see MPEP 2144(02) citing *In re Soli*, 317 F.2d 941, 137 U.S.P.Q. 797 (CCPA 1963)); and that "when an Examiner relies on a scientific theory, evidentiary support for the existence and meaning of that theory must be provided." Merely stating that the cumulative disclosures of the references provide evidence of a reasonable expectation of success is not sufficient evidentiary support for such a rationale (*In re Grose*, 592 F.2d 1161, 201 U.S.P.Q. 57 (CCPA 1979)).

In this case, there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements to reach the claimed invention as the Examiner

suggested, because the state of the art at the time of the present invention discourages a skilled artisan from adding fillers during the crosslinking step of a plasto-elastomeric mixture, due to their inhibitory effect on the catalyst.

As Mr. Carfagnini states in para. 7 of his Declaration, the present invention is an evolution of a technology patented in the 1980s by So.F.Ter (U.S. Pat. 4,835,204; "So.F.Ter"). This So.F.Ter patent, together with Danesi, describe how to produce plasto-elastomeric compositions containing cross-linked EPDM rubber. However, the chemical involved in the cross-linking process of the EPDM rubber makes the difference, i.e., Danesi makes use of a non-halogenated resin and a metal compound; therefore its novelty was to avoid using halogenated chemicals. The So.F.Ter patent makes use of a non-halogenated resin and a carboxylic acid; therefore its novelty over Danesi was to avoid the use of metal compounds as a catalyst in the cross-linking reaction, which leads to several advantages over use of a metal compound for the same purpose.

As Mr. Carfagnini states in para. 7-8 of his Declaration, the disclosure of Carfagnini discloses that additives are dispersed following cross-linking of the elastomeric component. The problem addressed by the present invention was the need to add further functionality to plasto-elastomeric compositions so as to improve the flame retardant properties or the sound deadening properties of the compositions. Such properties are conveyed by specific fillers.

As Mr. Carfagnini states in para. 8 of his Declaration, the solution, as embodied by the present application, was a plasto-elastomeric composition that shows the mechanical properties of compositions containing a cross-linked EPDM rubber phase together with the additional properties conveyed by the specific fillers.

Third, there is no reasonable degree of predictability of success in the proposed modification or combination

Each of KSR rationales (A), (B), (D), (E.) and (F) discussed above require that the cited reference combination yield predictable results. Applicants respectfully submit that this standard has not been met.

As Mr. Carfagnini states in para. 9 of his Declaration, at the time of the present invention, basic fillers were considered incompatible with a cross-linking reaction catalyzed by a carboxylic acid. In fact, these fillers can inhibit the carboxylic acid from acting as a catalyst of the cross-linking reaction. A person of ordinary skill in the art who would try to do so would not be able to obtain a plasto-elastomeric composition whose EPDM is properly cross-linked. Instead, the cross-linking reaction either does not occur or occurs at a very slow rate. Therefore, even if one of ordinary skill in the art somehow had been motivated to add fillers during the crosslinking step of a plasto-elastomeric mixture, there would have been no reasonable expectation of success of arriving at the claimed invention starting from the teachings of Danesi and Carfagnini, because the effect of adding an filler on crosslinking of a plasto-elastomeric mixture would have been unpredictable.

Unexpected Results

It is “[w]ell established that one way for an applicant to rebut a prima facie case of obviousness is to make a showing of “unexpected results,” i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward - that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often in the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995).

Moreover, the Federal Circuit has stated that “when an applicant demonstrates substantially improved results [as Soni did here], and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary.” *Id.* at 751, emphasis in original; and that “[g]iven a presumption of similar properties for similar compositions, substantially improved properties are *ipso facto* unexpected.” Furthermore, it is well established that “[t]he Board may not dismiss evidence of unexpected results simply because statistical validity has not been shown.” *In re: Kollman*, 595 F.2d 48, 56 n.8 (CCPA 1979).

As Mr. Carfagnini states in para. 11 of his Declaration, the claimed invention exhibited superior properties that a person of ordinary skill in the relevant art would have found surprising or unexpected in that basic inorganic fillers (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) do not affect the catalytic activity of carboxylic acid and thus cross-linking of a plasto-elastomeric mixture and filling can be carried out in a single process as presently claimed.

Since at the time the invention was made, *in the absence of* evidence to the contrary, the claimed invention as a whole would not have been obvious, to a person of ordinary skill in the art, Applicant respectfully urges that this ground for rejection be withdrawn.

2. Danesi, Carfagnini, and Credali

Claims 2-4, 6-7, 15-16, and 20-24 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over US 4,477,631 ("Danesi") in view of EP 230,212 ("Carfagnini") and WO 2004/026957 ("Credali").

The teachings of Danesi and Carfagnini are discussed above in Section 1 (Danesi and Carfagnini) of this response.

The Examiner conceded that while Danesi in view of Carfagnini discloses the metal compound used in dynamic vulcanization as magnesium oxide and alumina, Danesi in view of Carfagnini do not specify the metal compound as aluminum hydroxide or magnesium hydroxide nor specify the mineral filler used.

However, the Examiner contended that Credali discloses a composition comprising:

- 1) 8-25% by weight of propylene polymer or copolymer;
- 2) 75-92% by weight of elastomeric fraction comprising copolymer of ethylene, propylene and conjugated or non-conjugated diene; and
- 3) 40-80% by weight of inorganic filler (as to amended claims 14, 18, citing Abstract; page 6, lines 8-12) comprising magnesium hydroxide, aluminum hydroxide, calcium carbonate, and barium sulfate (citing page 10, lines 7-13; page 11, lines 3-4).

The Examiner contended that the composition comprises self-extinguishing properties, while retaining the physical and mechanical properties and having Shore A hardness of lower than 85 (citing page 11, lines 11-16).

The Examiner contended that all ranges in the composition of Credali are overlapping with the corresponding ranges in the composition of Danesi in view of Carfagnini. The Examiner contended that it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. (citing *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F. 3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974)).

The Examiner concluded that, in light of the cited patent case law, it would have been obvious that the overlapping of the ranges in the composition of Credali and those claimed in the instant invention establish a prima facie case of obviousness.

The Examiner contended that Danesi in view of Carfagnini recite the metal compound used in dynamic vulcanization being magnesium oxide and alumina, and also disclose the use of mineral fillers; but conceded that the references do not specify the metal compound and/or mineral fillers being aluminum hydroxide or magnesium hydroxide or barium sulfate.

Citing Credali, the Examiner contended that Credali discloses a similar composition as Danesi in view of Carfagnini, and further specify the use of 40-80% wt of magnesium hydroxide, aluminum hydroxide, calcium carbonate, or barium sulfate, wherein the composition of Credali comprises self-extinguishing properties, while retaining the physical and mechanical properties and having Shore A hardness of lower than 85 (citing page 11, lines 11-16).

The Examiner reasoned that it would have been obvious to one of ordinary skill in the art to combine the teachings of Danesi in view of Carfagnini with Credali to use magnesium hydroxide, aluminum hydroxide, calcium carbonate, or barium sulfate in the amount of 40-80% wt as a metal compound during vulcanization and/or as a mineral filler in the process of Danesi

in view of Carfagnini to ensure self-extinguishing properties while retaining the physical and mechanical properties of the composition of Danesi in view of Carfagnini, as taught by Credali.

The Examiner further reasoned that since the composition of Danesi in view of Carfagnini and Credali is produced by the process identical to that claimed in the instant invention with the use of the same curing system and metal compound, such as calcium carbonate, in the amount overlapping with that claimed in the instant invention, the properties of the plasto-elastomeric composition of Danesi in view of Carfagnini and Credali, including specific gravity and Shore hardness, will intrinsically be identical to those claimed in the instant invention.

Applicants' Response

Applicants have amended claim 15 in order to clarify the claim language. As such, independent claim 15, as amended, recites that the crosslinking of EPDM terpolymer by a carboxylic acid catalyst and a nonhalogenated alkylphenol-formaldehyde phenolic resin and the filling with a basic inorganic filler are carried out in a single process..

For the reasons set forth below, Applicants urge that, at the time the present invention was made, the claimed invention as a whole would not have been obvious to a person of ordinary skill in the art over Danesi, Carfagnini, and Credali; and that there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements as suggested by the Examiner.

First, the cited references do not teach, disclose, or suggest every element of the claims as amended.

The teachings and deficiencies of Danesi and Carfagnini are discussed above in Section 1 (Danesi and Carfagnini) of this response.

Credali does not cure the deficiencies of Danesi and Carfagnini.

Credali is cited by the Examiner for allegedly teaching a polyolefin composition comprising 40-80% wt of magnesium hydroxide, aluminum hydroxide, calcium carbonate, or

barium sulfate, wherein the composition of Credali comprises self-extinguishing properties, while retaining the physical and mechanical properties and having Shore A hardness of lower than 85. However, the polymerization process disclosed by Credali is carried out in the presence of Ziegler-Natta catalysts and/or metallocene catalyst, trialkylaluminum compound, optionally an electron donor, or a solid catalyst component comprising a halide or halogen-alcoholate of Ti and an electron donor compound supported on anhydrous magnesium chloride, wherein the solid catalyst component having a surface area of less than 200 m²/g, and a porosity higher than 0.2 ml/g (see the last paragraph bridging page 6 to page 7). Therefore, while Credali discloses adding inorganic fillers to provide self-extinguishing properties, it does not disclose or teach a process wherein inorganic fillers, especially basic inorganic fillers, are present during cross-linking of a plasto-elastomeric mixture, which is catalyzed by an aromatic carboxylic acid, without affecting the catalytic activity of the carboxylic acid.

Indeed, as Mr. Carfagnini states in para. 10 of his Declaration, Credali's compositions are not intended to have a cross-linking reaction take place at any time, and thus are not the result of a cross-linking reaction/reactive blending process. Instead, they are the result of a melt blending process.

Second, there is no teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art references or to combine prior art reference teachings to arrive at the claimed invention.

Applicants urge that a rationale offered to support a rejection under 35 U.S.C. 103 must rely on logic and sound scientific principle (see MPEP 2144(02) citing *In re Soli*, 317 F.2d 941, 137 U.S.P.Q. 797 (CCPA 1963)); and that "when an Examiner relies on a scientific theory, evidentiary support for the existence and meaning of that theory must be provided." Merely stating that the cumulative disclosures of the references provide evidence of a reasonable expectation of success is not sufficient evidentiary support for such a rationale (*In re Grose*, 592 F.2d 1161, 201 U.S.P.Q. 57 (CCPA 1979)).

Indeed, in this case, there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements to reach the claimed invention as the

Examiner suggested, because the state of the art at the time of the present invention discourages a skilled artisan from adding fillers during the crosslinking step of a plasto-elastomeric mixture, due to their inhibitory effect on carboxylic acid-based catalyst.

As Mr. Carfagnini states in para. 7 of his Declaration, the present invention is an evolution of a technology patented in the 1980s by So.F.Ter (U.S. Pat. 4,835,204; "So.F.Ter"). This So.F.Ter patent, together with Danesi, describe how to produce plasto-elastomeric compositions containing cross-linked EPDM rubber. However, the chemical involved in the cross-linking process of the EPDM rubber make the difference, i.e., Danesi makes use of a non-halogenated resin and a metal compound; therefore its novelty was to avoid using halogenated chemicals. The So.F.Ter patent makes use of a non-halogenated resin and a carboxylic acid; therefore its novelty over Danesi was to avoid the use of metal compounds as a catalyst in the cross-linking reaction, which leads to several advantages over use of a metal compound for the same purpose.

As Mr. Carfagnini states in para. 7-8 of his Declaration, the disclosure of Carfagnini discloses that additives are dispersed following cross-linking of the elastomeric component. The problem addressed by the present invention was the need to add further functionality to plasto-elastomeric compositions so as to improve the flame retardant properties or the sound deadening properties of the compositions. Such properties are conveyed by specific fillers. The solution, as embodied by the present application, therefore was a plasto-elastomeric composition that shows the typical mechanical properties of compositions containing across-linked EPDM rubber phase together with the additional properties conveyed by the specific fillers.

Third, there is no reasonable degree of predictability of success in the proposed modification or combination.

Each of *KSR* rationales (A), (B), (D), (E.) and (F) described in Section 1 require that the cited reference combination yield predictable results. Applicants respectfully submit that this standard has not been met.

As Mr. Carfagnini states in para. 9 of his Declaration, at the time of the present invention, basic fillers were considered incompatible with a cross-linking reaction catalyzed by a carboxylic acid. In fact, these fillers can inhibit the carboxylic acid from acting as a catalyst of the cross-linking reaction. Indeed, a person of ordinary skill in the art who would try to do so would not be able to obtain a plasto-elastomeric composition whose EPDM is properly cross-linked. Instead, the cross-linking reaction either does not occur or occurs at a very slow rate. Therefore, even if one of ordinary skill in the art somehow had been motivated to add fillers during the crosslinking step of a plasto-elastomeric mixture, there would have been no reasonable expectation of success of arriving at the claimed invention starting from the teachings of Danesi and Carfagnini, because the effect of adding an filler on crosslinking of a plasto-elastomeric mixture would have been unpredictable.

Unexpected Results

It is “[w]ell established that one way for an applicant to rebut a prima facie case of obviousness is to make a showing of “unexpected results,” i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward - that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often in the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995).

Moreover, the Federal Circuit has stated that “when an applicant demonstrates substantially improved results [as *Soni* did here], and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary.” *Id.* at 751, emphasis in original; and that “[g]iven a presumption of similar properties for similar compositions, substantially improved properties are ipso facto unexpected.” Furthermore, it is well established that “[t]he Board may not dismiss evidence of unexpected results simply because statistical validity has not been shown.” *In re Kollman*, 595 F.2d 48, 56 n.8 (CCPA 1979).

As Mr. Carfagnini states in para. 11 of his Declaration, the claimed invention exhibited superior properties that a person of ordinary skill in the relevant art would have found surprising or unexpected in that basic inorganic fillers (e.g., $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) do not affect the catalytic activity of carboxylic acid and thus cross-linking of a plasto-elastomeric mixture and filling can be carried out in a single process as presently claimed.

Since at the time the invention was made, *in the absence of* evidence to the contrary, the claimed invention as a whole would not have been obvious, to a person of ordinary skill in the art, Applicant respectfully urges that this ground for rejection be withdrawn.

3. Carfagnini, Credali, and Yamanaka

Claims 2-4, 6-7, 15-16, and 20-24 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over EP 230,212 ("Carfagnini") in view of WO 2004/026957 ("Credali") and US 2003/0013820 ("Yamanaka").

The Examiner's contention with regard to the teachings of Carfagnini are discussed above in Section 1 of this response.

As for claims 2, the Examiner contended that the polyolefin copolymers comprise ethylene, propylene, 1-butene, 1-pentene, monomers (citing page 4, lines 35-41).

As for claims 4 and 6, the EPDM terpolymers comprise copolymers of ethylene, propylene and diene comprising ethylidene-norbornene, 1,4-hexadiene, dicyclopentadiene (citing page 4, lines 26-31).

The Examiner conceded that Carfagnini fails to specify the amount of added filler and adding the filler until the composition shows a total specific gravity of 2 kg/dm^3 and hardness of Shore A 40 to Shore D 50, and the filler being calcium carbonate, aluminum hydroxide, magnesium hydroxide, and barium sulfate.

However, the Examiner contended that Credali discloses a composition comprising: 1) 8-25% by weight of propylene polymer or copolymer; 2) 75-92% by weight of elastomeric fraction

comprising copolymer of ethylene, propylene and conjugated or non-conjugated diene; and 3) 40-80% by weight of inorganic filler (citing Abstract; page 6, lines 8-12).

As for claims 7, and 20-24, the Examiner contended that the used inorganic fillers comprise magnesium hydroxide, aluminum hydroxide, calcium carbonate, and barium sulfate (citing page 10, lines 7-13; page 11, lines 3-4), wherein the filler can be used in the form of coated particles (citing page 10, lines 33-34). The Examiner further contended that the composition comprises self-extinguishing properties, while retaining the physical and mechanical properties, and having Shore A hardness of lower than 85 (citing page 11, lines 11-16).

Citing Yamanaka, the Examiner contended that Yamanaka discloses:

- (1) a composite material comprising ethylene-propylene-diene (EPDM) rubber, polyolefin, and an inorganic filler (citing abstract);
- (2) that the inorganic filler comprises barium sulfate (citing [0022]);
- (3) that the filler is added in a ratio of 200-500 parts by weight relative to 100 parts by weight of rubber (citing [0011]); and
- (4) that the composite comprises specific gravity of 1.6-1.8 g/cc (citing Table 3).

The Examiner contended that Carfagnini discloses:

- (a) a plasto-elastomeric composition and a process for producing a plastomer-elastomer compositions comprising mastification of the EPDM elastomer and fusion of the polyolefin plastomer;
- (b) thorough dispersion of the components; and
- (c) cross-linking of the elastomeric component with a blend of non-halogenated phenolic resin and salicylic acid followed by even dispersion of any other additives (citing p. 3, lines 54-58), such as fillers.

However, the Examiner conceded that Carfagnini fails to specify (1) the additives and fillers being magnesium hydroxide, aluminum hydroxide, calcium carbonate, or barium sulfate, which comprise 90% or less of the composition; and (2) addition of the filler to the composition until the final specific gravity is 2 kg/dm^3 .

The Examiner contended that Credali discloses a composition comprising:

- (a) 8-25% by weight of propylene polymer or copolymer;
- (b) 75-92% by weight of elastomeric fraction comprising copolymer of ethylene, propylene and conjugated or non-conjugated diene; and
- (c) 40-80% by weight of inorganic filler comprising magnesium hydroxide, aluminum hydroxide, calcium carbonate, and barium sulfate, wherein the composition comprises a Shore A hardness of lower than 85 (citing page 11, lines 17-18), good flame-retardancy, and good elastic properties (citing page 11, lines 21-29).

The Examiner contended that Yamanaka discloses a composite material comprising: ethylene-propylene-diene (EPDM) rubber, polyolefin, and an inorganic filler, wherein the filler is added in a ratio of 200-500 parts by weight relative to 100 parts by weight of rubber (citing para. [0011]) so that the composite comprises specific gravity of 1.6-1.8 g/cc.

The Examiner reasoned that it would have been obvious to one of ordinary skill in the art at the time of the present invention was made to add magnesium hydroxide, aluminum hydroxide, calcium carbonate, or barium sulfate fillers to the composition of Carfagnini so that the composition of Carfagnini, containing 40-80% of a filler, would comprise both good flame-retardancy and elasticity properties, similar to Credali, and the specific gravity of 1.6-1.8 g/cc, as in the composition of Yamanaka.

The Examiner contended that the process of Carfagnini in view of Credali and Yamanaka is identical to the process claimed in the instant invention; and that the ranges of the added

components in the process of Carfagnini in view of Credali and Yamanaka are overlapping with the ranges of the components added in the process claimed in the instant invention.

The Examiner further contended that the specific flame-retardancy, hardness, and elasticity of the composition depend on the specific amount of added filler and on the specific gravity of the composition; and that such limitation as the specific content of added filler becomes a result effective variable.

The Examiner reasoned that it would have been obvious to one skilled in the art at the time the invention was made to make variations in the amount of the added filler, and thus in the level of the specific gravity of the final composition, to reach the desired combination of flame-retardancy, hardness, and elasticity. (citing *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II)).

Applicants' Response

Applicants have amended claim 15 in order to clarify the claim language. As such, independent claim 15, as amended, recites that the crosslinking of EPDM terpolymer by a carboxylic acid catalyst and a nonhalogenated alkylphenol-formaldehyde phenolic resin and the filling with a basic inorganic filler are carried out in a single process.

For the reasons set forth below, Applicant urges that at the time the invention was made, the claimed invention as a whole would not have been obvious to a person of ordinary skill in the art over Carfagnini, Credali, and Yamanaka; and that there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements as suggested by the Examiner.

First, the cited references do not teach, disclose, or suggest every element of the claims as amended.

Teachings and deficiencies of Carfagnini and Credali are discussed above in Section 2 (Danesi, Carfagnini, and Credali) of this response.

Yamanaka fails to remedy the deficiencies of Carfagnini and Credali.

Yamanaka merely discloses a sound insulating material comprising ethylene-propylene-diene (EPDM) rubber, polyolefin and an inorganic filler, wherein the filler is added in a ratio of 200-500 parts by weight relative to 100 parts by weight of rubber so that composite comprises specific gravity of 1.6-1.8 g/cc. While Yamanaka discloses a list of inorganic fillers selected from zinc oxide, barium sulfate, and titanium dioxide, Yamanaka does not teach or suggest that basic inorganic fillers can be added during cross-linking of a plasto-elastomeric mixture, which is catalyzed by an aromatic carboxylic acid, without affecting the catalytic activity of the carboxylic acid.

Second, there is no teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art references or to combine prior art reference teachings to arrive at the claimed invention.

Applicants urge that a rationale offered to support a rejection under 35 U.S.C. 103 must rely on logic and sound scientific principle (see MPEP 2144(02) citing *In re Salt*, 317 F.2d 941, 137 U.S.P.Q. 797 (CCPA 1963)); and that "when an Examiner relies on a scientific theory, evidentiary support for the existence and meaning of that theory must be provided." Merely stating that the cumulative disclosures of the references provide evidence of a reasonable expectation of success is not sufficient evidentiary support for such a rationale (*In re Grose*, 592 F.2d 1161, 201 U.S.P.Q. 57 (CCPA 1979)).

Indeed, in this case, there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements to reach the claimed invention as the Examiner suggested, because the state of the art at the time of the present invention discourages a skilled artisan from adding fillers during the crosslinking step of a plasto-elastomeric mixture, due to their inhibitory effect on carboxylic acid-based catalyst.

As Mr. Carfagnini states in para. 8 of his Declaration, the problem addressed by the present invention was the need to add further functionality to plasto-elastomeric compositions so as to improve the flame retardant properties or the sound deadening properties of the compositions. Such properties are conveyed by specific fillers. The solution, as embodied by the present application therefore was a plasto-elastomeric composition that shows the typical

mechanical properties of compositions containing cross-linked EPDM rubber phase together with the additional properties conveyed by the specific fillers.

Third, there is no reasonable degree of predictability of success in the proposed modification or combination.

Each of KSR rationales (A), (B), (D), (E,) and (F) described in Section 1 of this response require that the cited reference combination yield predictable results. Applicants respectfully submit that this standard has not been met.

As Mr. Carfagnini states in para. 9 of his Declaration, at the time of the present invention, basic fillers were considered incompatible with a cross-linking reaction catalyzed by a carboxylic acid. In fact, these fillers can inhibit the carboxylic acid from acting as a catalyst of the cross-linking reaction. Indeed, a person of ordinary skill in the art who would try to do so would not be able to obtain a plasto-elastomeric composition whose EPDM is properly cross-linked. Instead, the cross-linking reaction either does not occur or occurs at a very slow rate. Therefore, even if one of ordinary skill in the art somehow had been motivated to add fillers during the crosslinking step of a plasto-elastomeric mixture, there would have been no reasonable expectation of success of arriving at the claimed invention starting from the teachings of Carfagnini, Credali, and Yamanaka, because the effect of adding an filler on crosslinking of a plasto-elastomeric mixture would have been unpredictable.

Unexpected Results

It is "[w]ell established that one way for an applicant to rebut a prima facie case of obviousness is to make a showing of "unexpected results," i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward - that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often in the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results." *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995).

Moreover, the Federal Circuit has stated that “when an applicant demonstrates substantially improved results [as Soni did here], and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary.” *Id.* at 751, emphasis in original; and that “[g]iven a presumption of similar properties for similar compositions, substantially improved properties are ipso facto unexpected.” Furthermore, it is well established that “[t]he Board may not dismiss evidence of unexpected results simply because statistical validity has not been shown.” *In re Kollman*, 595 F.2d 48, 56 n.8 (CCPA 1979).

As Mr. Carfagnini states in para. 11 of his Declaration, the claimed invention exhibited superior properties that a person of ordinary skill in the relevant art would have found surprising or unexpected in that basic inorganic fillers (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) do not affect the catalytic activity of carboxylic acid and thus cross-linking of a plasto-elastomeric mixture and filling can be carried out in a single process as presently claimed.

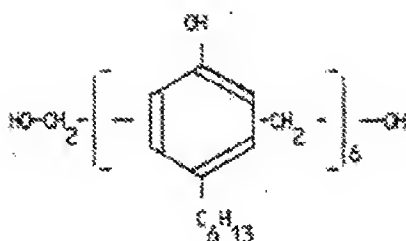
Since at the time the invention was made, *in the absence of* evidence to the contrary, the claimed invention as a whole would not have been obvious to a person of ordinary skill in the art, Applicant respectfully urges that this ground for rejection be withdrawn.

4. Carfagnini, Credali, and Sullivan

Claims 2-4, 6-7, 15-16, and 20-24 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over EP 230,212 (“Carfagnini”) in view of WO 2004/026957 (Credali) and US 2004/0209707 (“Sullivan”).

The Examiner’s contentions with regard to teachings of Carfagnini and Credali are discussed above in Section 2 (Danesi, Carfagnini, and Credali).

As for claim 16, the Examiner contended that the phenolic resin is a phenol-formaldehyde resol resin having the following formula:



As for claim 2, the Examiner contended that the polyolefin copolymers comprise ethylene, propylene, 1-butene, 1-pentene, monomers (citing page 4, lines 35-41).

As for claims 4 and 6, the Examiner contended that EPDM terpolymers comprise copolymers of ethylene, propylene and diene comprising ethylidene-norbornene, 1,4-hexadiene, dicyclopentadiene (citing page 4, lines 26-31).

The Examiner conceded that Carfagnini fails to specify (1) the amount of added filler and adding the filler until the composition shows a total specific gravity of 2 kg/dm³ and hardness of Shore A 40 to Shore D 50; and (2) the filler being calcium carbonate, aluminum hydroxide, magnesium hydroxide, or barium sulfate. However, the Examiner contended that Credali discloses a composition comprising: (1) 8-25% by weight of propylene polymer or copolymer; (2) 75-92% by weight of elastomeric fraction comprising copolymer of ethylene, propylene and conjugated or non-conjugated diene; and (3) 40-80% by weight of inorganic filler (citing Abstract; page 6, lines 8-12).

As for claims 7 and 20-24, the Examiner contended that the used inorganic fillers comprise magnesium hydroxide, aluminum hydroxide, calcium carbonate, and barium sulfate (citing page 10, lines 7-13 and page 11, lines 3-4), wherein the filler can be used in the form of coated particles (citing page 10, lines 33-34). The Examiner further contended that the composition comprises self-extinguishing properties, while retaining the physical and mechanical properties and having Shore A hardness of lower than 85 (citing page 11, lines 11-16).

Citing Sullivan, the Examiner contended that Sullivan discloses a multi-layered article, such as a golf ball, wherein each layer has a different specific gravity and a different Shore

hardness (citing page. 11 and claim 1). Specifically, the Examiner contended that the outer core layer comprising an EPDM rubber (citing para. [0042] and [0043]) is heavily filled with a density increasing material to provide a specific gravity of greater than 1.75 g/cc or greater than 2 g/cc (citing para. [0013]). The Examiner further contended that the filler comprises calcium carbonate having a specific gravity of 2.71 g/cc or barium sulfate having a specific gravity of 4.6 g/cc (citing table in [0062]); and that the outer core layer has a Shore D hardness of at least 30 (citing [0051]).

The Examiner contended that Sullivan teaches that by addition of density increasing fillers, such as calcium carbonate or barium sulfate to specific compositions of different layers, the desired specific gravity and hardness of each layer may be achieved.

The Examiner contended that Carfagnini discloses:

- (1) a plasto-elastomeric composition and a process for producing a plastomer-elastomer compositions comprising mastification of the EPDM elastomer and fusion of the polyolefin plastomer; and
- (2) thorough dispersion of the components; cross-linking of the elastomeric component with a blend of non-halogenated phenolic resin and salicylic acid followed by even dispersion of any other additives such as fillers (citing page 3, lines 54-58).

However, the Examiner conceded that Carfagnini fails to specify (1) the additives being magnesium hydroxide, aluminum hydroxide, calcium carbonate, or barium sulfate, which comprise 90% or less of the composition; and (2) addition of the filler to the composition until the final specific gravity is 2 kg/dm³.

The Examiner contended that Credali discloses a composition comprising:

- a) 8-25% by weight of propylene polymer or copolymer;
- b) 75-92% by weight of elastomeric fraction comprising copolymer of ethylene, propylene and conjugated or non-conjugated diene; and

c) 40-80% by weight of inorganic filler comprising magnesium hydroxide, aluminum hydroxide, calcium carbonate, barium sulfate, wherein the composition comprises a Shore A hardness of lower than 85 (citing page 11, lines 17-18), good flame-retardancy, and good elastic properties (citing page 11, lines 21-26).

The Examiner further contended that since Sullivan teaches that by addition of density increasing fillers, such as calcium carbonate or barium sulfate, to specific compositions, the desired specific gravity and the desired hardness of each composition may be achieved.

The Examiner contended that it would have been obvious to one of ordinary skill in the art at the time the present invention was made to add magnesium hydroxide, aluminum hydroxide, calcium carbonate, or barium sulfate fillers to the composition of Carfagnini, so that the composition of Carfagnini, containing 40-80% of a filler, would have both good flame-retardancy and elasticity properties, similar to Credali, wherein by addition of specific filler to in a specific amount, the desired specific gravity and Shore hardness of the composition may be obtained. The Examiner further contended that since the specific gravity and Shore hardness of the composition depends on the amount of added specific filler having a specific gravity, such limitation as the amount of added specific filler having specific gravity becomes a result effective variable.

Based on the above grounds, the Examiner reasoned that it would have been obvious to one skilled in the art at the time the invention was made to make variations in the amount of specific filler having specific gravity added to the rubber composition to obtain the desired specific gravity and Shore hardness of the final composition (citing *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II)).

Applicants' Response

Applicants have amended claim 15 in order to clarify the claim language. As such, independent claim 15, as amended, recites that the crosslinking of EPDM terpolymer by a carboxylic acid catalyst and a nonhalogenated alkylphenol-formaldehyde phenolic resin and the filling with a basic inorganic filler are carried out in a single process.

For the reasons set forth below, Applicant urges that at the time the invention was made, the claimed invention as a whole would not have been obvious to a person of ordinary skill in the art over Carfagnini, Credali, and Sullivan; and that there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements as suggested by the Examiner.

First, the references do not teach, disclose, or suggest every element of the claims as amended.

Teachings and deficiencies of Carfagnini and Credali are discussed above in Section 2 (Danesi, Carfagnini, and Credali) of this response.

Sullivan fails to cure the deficiencies of Carfagnini and Credali.

Sullivan discloses a multi-layered golf ball, wherein each of the layers has different specific gravity and different Shore hardness. Specifically, the outer core layer comprising an EPDM rubber in Sullivan is filled with a density increasing material, such as calcium carbonate or barium sulfate, which has a specific gravity of greater than 1.75g/cc or greater than 2g/cc. The filler comprises calcium carbonate having a specific gravity of 2.71 g/cc or barium sulfate having a specific gravity of 4.6 g/cc, and the outer core layer has Shore D hardness of at least 30. However, Sullivan does not teach or suggest that basic inorganic fillers (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$, and CaCO_3) can be added during the crosslinking step of a plasto-elastomeric mixture, which is catalyzed by an aromatic carboxylic acid, without affecting the catalytic activity of the carboxylic acid.

Second, there is no teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art references or to combine prior art reference teachings to arrive at the claimed invention.

Applicants urge that a rationale offered to support a rejection under 35 U.S.C. 103 must rely on logic and sound scientific principle (see MPEP 2144(02) citing *In re Soli*, 317 F.2d 941, 137 U.S.P.Q. 797 (CCPA 1963)); and that "when an Examiner relies on a scientific theory, evidentiary support for the existence and meaning of that theory must be provided." Merely

stating that the cumulative disclosures of the references provide evidence of a reasonable expectation of success is not sufficient evidentiary support for such a rationale (*In re Grose*, 592 F.2d 1161, 201 U.S.P.Q. 57 (CCPA 1979)).

Indeed, in this case, there is no plausible reason that would have prompted a person of ordinary skill in the art to combine the cited elements to reach the claimed invention as the Examiner suggested, because the state of the art at the time of the present invention discourages a skilled artisan from adding fillers during the crosslinking step of a plasto-elastomeric mixture, due to their inhibitory effect on carboxylic acid-based catalyst.

As Mr. Carfagnini states in para. 8 of his Declaration, the problem addressed by the present invention was the need to add further functionality to plasto-elastomeric compositions so as to improve the flame retardant properties or the sound deadening properties of the compositions. Such properties are conveyed by specific fillers. The solution, as embodied by the present application therefore was a plasto-elastomeric composition that shows the typical mechanical properties of compositions containing across-linked EPDM rubber phase together with the additional properties conveyed by the specific fillers.

Third, there is no reasonable degree of predictability of success in the proposed modification or combination

Each of KSR rationales (A), (B), (D), (E.) and (F) described above in Section 1 of this response require that the cited reference combination yield predictable results. Applicants respectfully submit that this standard has not been met.

As Mr. Carfagnini states in para. 9 of his Declaration, at the time of the present invention, basic fillers were considered incompatible with a cross-linking reaction catalyzed by a carboxylic acid. In fact, these fillers can inhibit the carboxylic acid from acting as a catalyst of the cross-linking reaction. Indeed, a person of ordinary skill in the art who would try to do so would not be able to obtain a plasto-elastomeric composition whose EPDM is properly cross-linked. Instead, the cross-linking reaction either does not occur or occurs at a very slow rate. Therefore, even if one of ordinary skill in the art somehow had been motivated to add fillers during the crosslinking

step of a plasto-elastomeric mixture, there would have been no reasonable expectation of success of arriving at the claimed invention starting from the teachings of Carfagnini, Credali, and Sullivan, because the effect of adding an filler on crosslinking of a plasto-elastomeric mixture would have been unpredictable.

Evidence of Unexpected Results

It is “[w]ell established that one way for an applicant to rebut a *prima facie* case of obviousness is to make a showing of “unexpected results,” i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward - that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often in the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995).

Moreover, the Federal Circuit has stated that “when an applicant demonstrates substantially improved results [as Soni did here], and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary.” *Id.* at 751, emphasis in original; and that “[g]iven a presumption of similar properties for similar compositions, substantially improved properties are *ipso facto* unexpected.” Furthermore, it is well established that “[t]he Board may not dismiss evidence of unexpected results simply because statistical validity has not been shown.” *In re Kollman*, 595 F.2d 48, 56 n.8 (CCPA 1979).

Moreover, as Mr. Carfagnini states in para. 11 of his Declaration, the claimed invention exhibited superior properties that a person of ordinary skill in the relevant art would have found surprising or unexpected in that basic inorganic fillers (such as, $\text{Al}(\text{OH})_3$, $\text{Mg}(\text{OH})_2$ and CaCO_3) do not affect the catalytic activity of carboxylic acid and thus cross-linking of a plasto-elastomeric mixture and filling can be carried out in a single process as presently claimed.

Since at the time the invention was made, *in the absence of* evidence to the contrary, the claimed invention as a whole would not have been obvious, to a person of ordinary skill in the art, Applicant respectfully urges that this ground for rejection be withdrawn.

Response to Arguments

A. In response to Applicants' arguments submitted in the reply filed November 23, 2010, the Examiner contended:

- 1) that Carfagnini discloses the use of fillers (citing page 4, lines 18-25);
- 2) that though Carfagnini does not specify how to incorporate such fillers with the composition and yet retain desired properties, Credali discloses the similar composition as Carfagnini, further specifying incorporation of 40-80% of inorganic fillers;
- 2) that Credali cites EP 1,043,733 as showing that incorporation of flame-retardant inorganic filler into a composition comprising a heterophase copolymer having at least 45% wt of an elastomeric phase and further a thermoplastic polypropylene phase leads to low elongation (citing page 2, lines 15-24 of Credali);
- 3) that Credali further continues that in order to compete with plasticized PVC, it would be necessary to provide flexible polyolefin compositions, having low flexural modulus and hardness, capable of incorporating large amounts of filler without deterioration of physical and mechanical properties (citing page 2, lines 25-29 of Credali); and
- 4) that to make the composition "flexible" and "having low flexural modulus and hardness, capable of incorporating large amounts of filler without deterioration of physical and mechanical properties," Credali discloses the use of high amounts of elastomeric fraction (75-92% wt) (citing page 3, lines 22-27).

The Examiner contended that the level of deterioration or the retaining of physical and mechanical properties of the plasto-elastomeric composition in the presence of large amount of inorganic filler depends on the amount of elastomeric fraction present in the composition. The Examiner reasoned that since large amounts of inorganic fillers ensure good flame retardant

properties, it would have been obvious to a skilled artisan to vary the amount of used elastomeric fraction of the plasto-elastomeric composition on one side and the amount of added inorganic filler on the other side to find to desired combination of flame-retardant and also physical-mechanical properties. The Examiner further contended that instant claim 15 is silent with respect to the amount of the elastomeric fraction in the plasto-elastomeric composition.

Applicants' Response

Applicants' response to the Examiner's contention with respect to Carfagnini and Credali is presented above in Section 2-4 of this paper.

B. In response to Applicants' arguments:

(1) that Credali uses solid catalyst comprising a halide or halogen alcoholate of Ti and an electron donor supported on anhydrous magnesium chloride, whereas Carfagnini employs a non-halogenated phenolic resin with an aromatic carboxylic acid as a catalyst; and

(2) that, therefore, there is no evidence that a person of skill in the art would have expected that filler of Credali could have been successfully used under the reaction conditions of Carfagnini,

the Examiner contended that the catalyst of Credali comprising a halide or halogen alcoholate of Ti and an electron donor supported on anhydrous magnesium chloride, to which Applicant is referring to, is a catalyst for copolymerization of propylene, ethylene and diene; or a sequential polymerization (citing page 6, lines 27-30) to produce a heterophasic polyolefin composition; whereas the non-halogenated phenolic resin in conjunction with aromatic carboxylic acid of Carfagnini is a cross-linking catalyst for cross-linking of EPDM (citing page 2, lines 37-40). The Examiner contended that Carfagnini states that inorganic fillers may be added to the composition (citing page 4, lines 18-23 of Carfagnini) for the purpose of enhancing the processability and/or properties of the materials (citing page 4, lines 54-56). The Examiner reasoned that it would have been obvious to a skilled artisan that inorganic fillers can be successfully used in the composition of Carfagnini as well.

The Examiner further contended that Carfagnini discloses a process for preparing a plasto-elastomer composition from EPDM and polyolefin using non-halogenated phenolic resin together with an aromatic carboxylic acid, whose process avoids environmental and personal risk stemming from production of chlorine and requires lower temperatures and less time than the convention processes. The Examiner contended that Carfagnini further discloses that the composition may further comprise inorganic fillers.

With regard to Credali, the Examiner contended that Credali discloses a similar EPDM-polyolefin composition but specified the use of 40-80% wt of fillers including aluminum hydroxide, calcium carbonate and barium sulphate, wherein the composition of Credali comprises self-extinguishing properties while retaining physical and mechanical properties.

The Examiner reasoned that it would have been obvious to one of ordinary skill in the art to combine the teachings of Carfagnini and Credali and to include the 40-80% wt of filler in the composition of Carfagnini so that the composition of Carfagnini would comprise good flame-retardant properties but also retain physical and mechanical properties, as taught by Credali.

Applicants' Response

Applicants' response to the Examiner's contention with respect to Carfagnini and Credali is presented above in Sections 2-4 of this paper.

C. In response to Applicants' arguments that Yamanaka does not disclose a process for producing a plasto-elastomeric compound in the presence of non-halogenated alkyl-formaldehyde resin, the Examiner contended that though Yamanaka does not disclose a process for producing a plasto-elastomeric compound in the presence of non-halogenated alkyl-formaldehyde resin, Yamanaka is a secondary reference. The Examiner contended that such a secondary reference does not need to teach all limitations, stating that "[i]t is not necessary to be able to bodily incorporate the secondary reference into the primary reference in order to make the combination" (citing *In re Nievelt*, 179 USPQ 224 (CCPA 1973)).

Applicants' Response

Applicants' Response to the Examiner's contention with regard to Yamanaka is presented above in Section 3 (Carfagnini, Credali, and Yamanaka) of this paper.

D. In response to Applicants' arguments that the composition of Sullivan only contains an EPDM rubber and does not disclose a process for producing a plasto-elastomeric compound in the presence of a non-halogenated alkyl-formaldehyde resin, the Examiner contended that though Sullivan does not disclose a polyolefin and a process for producing a plasto-elastomeric compound in the presence of non-halogenated alkyl-formaldehyde resin, Sullivan is a secondary reference, and that such a secondary reference does not need to teach all limitations, citing that "[i]t is not necessary to be able to bodily incorporate the secondary reference into the primary reference in order to make the combination." (*In re Nievelt*, 179 USPQ 224 (CCPA 1973)).

Applicants' Response

Applicants' response to the Examiner's contention with regard to Sullivan is presented above in Section 4 (Carfagnini, Credali, and Sullivan) of this paper.

* * *

Since there is no prior art that teaches or suggests the claimed invention, Applicants respectfully request that the Examiner withdraw all objections to and rejections of the present invention.


Applicant urges that this application is now in condition for allowance and earnestly solicits early and favorable action by the Examiner. If the Examiner believes that issues may be resolved by a telephone interview, the Examiner is respectfully urged to telephone the undersigned at 973-360-7934. The undersigned also may be contacted via e-mail at lubitb@glaw.com.

AUTHORIZATION

The Commissioner hereby is authorized to charge any fees, including the appropriate fee for a submission of a terminal disclaimer by a small entity, which may be required, or credit any overpayment to Deposit Account 501561.

Respectfully submitted,
For Greenberg Traurig
By

Date: 6/15/11


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